

ECOLOGY OF THE CRANE HAWK IN TIKAL NATIONAL PARK, PETÉN, GUATEMALA

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The breeding ecology of the crane hawk (*Geranospiza caerulescens*) was studied from 19 February to 15 July 1994 in Tikal National Park, located in the northern department of the Petén, Guatemala. This research is part of a comprehensive study of raptors being conducted by The Peregrine Fund, Inc.'s Maya Project in Guatemala, Mexico, and Belize. Areas of crane hawk activity were located from observation points in canopy-emergent trees, via foot searches, and by vocalizations. Breeding and nonbreeding crane hawks were monitored to estimate density within the park. Measurements of nesting habitat were collected for both active and historic nest sites. In 1994, five active nests were located and studied in the park. Growth and development of six nestlings were measured. Rodents (Heteromyidae and Muridae) comprised 56.3% of 87 identified prey items in the diet while frogs, lizards, birds, bats, and snakes made up the remainder. Adult crane hawks were fitted with radiotransmitters to estimate home ranges, movements after breeding and habitat use. To study post-fledging dependency and dispersal, one male fledgling was fitted with a radiotransmitter. Preliminary conclusions of the first year of a 2-yr study indicate that certain nesting habitat components, as well as intra- and inter-specific interactions are important factors influencing nesting success and productivity.

DNA FINGERPRINTING REVEALS SUCCESSFUL POLYGyny IN THE LESSER KESTREL (*FALCO NAUMANNI*)

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Raptorial species are predominantly monogamous. Although a few species seem to practice alternative mating systems, no paternity analyses have been published so far to confirm polygamy in any bird of prey. Using DNA fingerprinting we examined parentage in 28 nests of lesser kestrels (*Falco naumanni*) from northern Spain and confirmed the first case of successful polygyny in the species. In one of the nests, two females and one male were observed several times. DNA fingerprinting revealed that the first of the four nestlings reared at the nest was from the earliest arriving female, while the remaining three were from the second female. The attending male was the father of all four nestlings. Our results indicate variability from strict

monogamy in this falcon and emphasize the importance of behavioral observations and genetic markers to study breeding success of raptors.

THE FERTILIZATION WINDOW OF THE AMERICAN KESTREL (*FALCO SPARVERIUS*): CHARACTERIZATION AND CONSEQUENCES

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Raptors are believed to increase their frequency of copulation during the fertilization window, a period between ovulation and eggshell formation when the ovum is fertilized. This time interval has not been characterized for any raptor species, although its definition in the reproductive process and for sperm competition theory is critical. We observed the daily laying patterns of 41 pairs of American kestrels in captivity recording time, date and consistency of laying as well as the effect of weather patterns and egg pulling. Of 156 ovipositions we observed, 48% were laid in the morning (0730–1130 H). Variation between pairs in starting dates and consistency of egg laying did not correlate significantly to bird age or weather. Egg pulling on 20 focal pairs had no significant effects. Our results indicate a wider fertilization window than previously suggested, which better explains the highly variable daily copulation frequency of this falcon.

GROWTH, DEVELOPMENT AND EXPERIMENTAL MANAGEMENT OF THE MADAGASCAR FISH-EAGLE (*HALIAEETUS VOCIFEROIDES*)

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Increasing population size and distribution in suitable unoccupied habitat is one of several management options that would help prevent extinction of the Madagascar fish-eagle, one of the rarest raptors in the world. Breeding studies in 1991 and 1992 showed that this species exhibits obligate siblicide. In 1993 we tested "Abel rescue" as a low-cost *in situ* method for increasing annual production in Madagascar fish-eagles. Of three nests tested, two fledged two young using an abbreviated captive rearing period in which removed siblings were reintroduced to the nest as soon as they could defend themselves from siblings and compete for food. Measurements of growth, and description of behavioral development of chicks in captivity and in the nest for a period close to fledging, provided a method to estimate age of chicks in the nest as well as a better understanding of siblicide in this species.